Assessment of carotid intima-media thickness in patients with polycystic ovary syndrome and its association with hormonal and lipid profiles

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Context: Polycystic ovary syndrome (PCOS) represents one of the most common endocrinopathies in women of reproductive age. It has been associated with an increased risk for metabolic disturbances and cardiovascular disease. Intima-media thickness of the common carotid artery (CIMT) represents a valid surrogate marker of early systemic atherosclerosis.

Objective: The aim of this study was to investigate if CIMT is increased in PCOS patients compared to healthy control subjects and if there is an association with hormonal and lipid profiles.

Methods: Patients: In this cross-sectional study, 41 patients with PCOS were consecutively recruited and compared to 43 healthy control subjects of similar age, BMI, and frequency of smokers. Interventions: Past medical history, anthropometrical measurements, as well as hormonal, lipidemic and glycemic parameters were obtained in all subjects. B-mode ultrasound enabled CIMT measurement at the far wall of the left and right common carotid artery. Outcome Measures: Statistical analyses were performed using unpaired two-tailed t-test, χ^2-test and multiple linear regression analysis in order to identify independent factors that predict CIMT. Two-sided p-values<0.05 were considered statistically significant.

Results: Patients with PCOS featured significantly increased CIMT values in comparison to healthy controls (0.49±0.04mm vs. 0.37±0.04mm respectively, p<0.001). They were characterized by a generally increased cardiovascular risk profile, with significantly increased BMI, androgen and lipid levels (p<0.001), as well as a higher prevalence of abdominal adiposity, metabolic syndrome, smokers and parental history of metabolic disorders. Correlation analysis showed a positive association between CIMT and the adverse metabolic risk profile. The diagnosis of PCOS was the strongest predictor of CIMT (β=0.836, p<0.001, R2=0.70), even after multiple adjustments for BMI, age and smoking status (β=0.797, p<0.001, R2=0.73). A model among oligomenorrhoic PCOS patients enabled to reveal a relationship between CIMT and the suspected duration of disease (β=0.373, p=0.021, R2=0.14).

Conclusions: Patients with PCOS are likely to feature signs of early systemic atherosclerosis already at young age. Early exposure to adverse cardiovascular risk factors in the framework of this disorder may possibly have long-term consequences on the vascular system. An early vessel screening might thus already be beneficial in these patients at younger age.

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